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EXAMINER	
HUGHES, SCOTT A	

ART UNIT	PAPER NUMBER
3663	

MAIL DATE	DELIVERY MODE
10/31/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/519,882	MELDAHL, PAUL	
	Examiner	Art Unit	
	SCOTT A. HUGHES	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,6-32,34 and 35* is/are pending in the application.

4a) Of the above claim(s) *24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6-23,25-32,34 and 35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 December 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/8/2008 has been entered.

Response to Arguments

Applicant's arguments and amendments filed 7/8/2008 have been fully considered but they are not persuasive.

Applicant argues that Berni does not disclose a moving detection area. Applicant argues that Berni discloses a system that is only capable of detecting at one specific location that is stationary. Applicant argues that Berni teaches away from a moving detection area in order to avoid difficulties in picking up and relocating a large number of conventional geophone-style detectors in a land based survey. Applicant argues that the streamer cable disclosed by Berni does not monitor any particular detection area. These arguments are not persuasive as Berni specifically disclose that "with the apparatus and methods of the present invention, moving a seismic land detector group will be as easy as moving a marine streamer cable in a marine environment." (Column 5, Lines 12-20). Therefore, Berni specifically discloses that the detection area can be

moved and that it is not fixed or stationary. Further, Berni specifically discloses that the system detects motion at different locations (Column 5, Line 10 to Column 6, Line 37) (Fig. 4). Applicant's argument relating to the beam steering of Berni ensuring that the laser is focused on a stationary area rather than successively on a plurality of non-discrete, overlapping segments is not persuasive. Berni specifically discloses that the laser can scan quickly between each of the locations where seismic signals are desired to be detected and that the sampling can be done every 4 m, wherein the parts are the overlapping areas of the divided survey area (Column 5, Line 10 to Column 6, Line 37). Therefore, Berni discloses successively scanning a plurality of non-discrete, overlapping segments.

Applicant's arguments that the system of Berni cannot sample non-discrete overlapping segments because the aircraft of Berni would travel at 200 mph at 3300 ft. This argument is not persuasive because Berni does not limit the airborne system to an aircraft traveling at 200 mph at 3300, but gives other examples of a helicopter or balloon, or any other type of above ground mobile platform (Column 4, Lines 61-65; Column 5, Lines 45-65). These systems can move at speeds much slower than 200 mph. Further, Berni specifically discloses sampling non-discrete overlapping segments of a survey area as discussed above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4, 6-13, 16-19, 21-23, 25-28, 30, 32 and 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Berni (5070483).

With regard to claim 1, Berni discloses a method of seismic exploration which comprises: generating a seismic event (Fig. 10) (Column 2; Column 5, Lines 1-10); applying the seismic event to a body of water having a sea bottom (Fig. 10) (Column 2; Column 5, Lines 1-10; Column 21, Lines 5-10); detecting a response to the seismic event within a detection area of the sea bottom from a position spaced apart from the sea bottom (abstract; Column 4, Line 44 to Column 6, Line 22; Columns 8-12; Column 18, Line 50 to Column 19, Line 62), the response including P-waves and S-waves resulting from the seismic event (Figs. 3-4) (abstract; Column 4, Line 44 to Column 5, Line 45; Columns 8-12; Column 18, Line 50 to Column 19, Line 62); and analyzing the response (Column 3, Line 45 to Column 5, Line 45; Column 7, Line 16, to Column 21); wherein: detecting the response includes monitoring successively each of a plurality of non-discrete, overlapping segments defining the detection area and to ascertain movements of particles in the detection area (Figs. 3-8) (Column 4, Line 44 to Column 6, Line 45) over a response period and recording a detected response of the seismic event, the response period being a predetermined period of time after the seismic event (abstract; Column 2; Column 3, Line 45 to Column 6, Line 45) (Fig. 9); analyzing the response includes analyzing the movements of particles in the detection area of the sea bottom ascertained during the response period response (Column 3, Line 45 to Column

6, Line 45; Column 7, Line 16, to Column 21). Berni discloses that the monitoring includes using monitoring apparatus which is moved relative to the sea bottom during the response period (Column 4, Line 44 to Column 6, Line 37; Column 12, Line 37 to Column 16, Line 56).

With regard to claim 2, Berni discloses applying successively to each of a plurality of non-discrete, overlapping segments light, in the form of visible light (Column 5, Line 45 to Column 8, Line 19; Column 9; Columns 13-14).

With regard to claim 4, Berni discloses that the analyzing includes eliminating from the detected response of noise caused by the relative movement of the monitoring apparatus (Column 5, Line 10 to Column 6, Line 37; Column 12, Line 37 to Column 16, Line 56; Column 18, Line 24 to Column 20, Line 22).

With regard to claim 6, Berni discloses that using the monitoring apparatus includes using a plurality of devices simultaneously at different locations (Column 5, Line 10 to Column 6, Line 37).

With regard to claim 7, Berni discloses that the response is transformed to and recorded in digital form (Column 6, Line 23 to Column 8).

With regard to claim 8, Berni discloses analyzing surface particle displacements (Columns 5-6).

With regard to claim 9, Berni discloses that using the monitoring apparatus includes directing a source of coherent mono frequency light directed at the detection area, and receiving reflected coherent light (Columns 5-6; Column 7, Line 55 to Column 8, Line 3) (Figs. 2-8).

With regard to claim 10, Berni discloses using coherent light and a reference beam to make speckle patterns by means of interferometry, and analyzing speckle patterns (Figs. 2-8) (Column 3, Line 45-68; Column 4, Line 46 to Column 6, Line 10; Column 6, Line 45 to Column 12).

With regard to claim 11, Berni discloses that using the monitoring apparatus includes using a video recording apparatus (Figs. 2-4) (Columns 6-10, 13).

With regard to claim 12, Berni discloses that using the video recording apparatus includes using one or more cameras operating on a basis of visible light. (Figs. 2-4) (Columns 6-10, 13).

With regard to claim 13, Berni applying the seismic event directly to the sea bottom (Column 20, Line 63 to Column 21, Line 15).

With regard to claim 16, Berni discloses that analyzing includes the eliminating noise representing disturbances caused by the motion of the monitoring apparatus from the detected response (Column 12, Line 55 to Column 16), the monitoring apparatus being towed or self-propelled (Column 5, Lines 10-45).

With regard to claim 17, Berni discloses ascertaining movement of sand particles on the sea floor (Column 20, Line 63 to Column 21, Line 15).

With regard to claim 18, Berni discloses that generating the seismic event includes generating a seismic wave having a wavelength in the range of approximately 5 to 100 m and a duration of up to approximately 3 s (Fig. 9) (Columns 1-2).

With regard to claim 19, Berni discloses monitoring over a response period that is in a range of 4 to 8 seconds (Fig. 9) (Columns 1-2).

With regard to claim 21, Berni discloses an apparatus for carrying out seismic exploration comprising: a seismic event generator; a seismic delivery device adapted to apply the seismic event to a body of water having a sea bottom (Fig. 10) (Column 2; Column 5, Lines 1-10; Column 21, Lines 5-10); a detecting apparatus adapted to detect within a detection area of the sea bottom a response to the seismic event, the response including P-waves and S-waves resulting from the seismic event, the detecting apparatus being spaced apart from the sea bottom (Figs. 3-8) (abstract; Column 4, Line 44 to Column 6, Line 37; Columns 8-12; Column 18, Line 50 to Column 19, Line 62; Column 21, Lines 5-10); an analyzer (Column 3, Line 45 to Column 5, Line 45; Column 7, Line 16, to Column 21); wherein: the detecting apparatus includes a monitoring apparatus adapted to monitor successively each of a plurality of non-discrete, overlapping segments defining the detection area to ascertain movements of particles at in the detection area over a response period (Column 4, Line 44 to Column 6, Line 45), and a recording apparatus adapted to record a detected response to the seismic event, the response period being a predetermined response period after the seismic event (abstract; Column 2; Column 3, Line 45 to Column 6, Line 45) (Fig. 9). Berni discloses that the monitoring apparatus is adapted to move relative to the sea bottom during the response period (Column 4, Line 44 to Column 6, Line 37; Column 12, Line 37 to Column 16, Line 56).

With regard to claim 22, Berni discloses that the monitoring apparatus is adapted to apply to the detection area light, in the form of visible light (Column 5, Line 45 to Column 8, Line 19; Column 9; Columns 13-14).

With regard to claim 23, Berni discloses that the monitoring apparatus is adapted to move relative to the sea bottom during the response period (Column 4, Line 44 to Column 6, Line 37; Column 12, Line 37 to Column 16, Line 56).

With regard to claim 25, Berni discloses that the monitoring apparatus includes several monitoring devices which can be used simultaneously at different locations (Column 5, Line 10 to Column 6, Line 37).

With regard to claim 26, Berni discloses that monitoring apparatus includes a source of coherent light arranged to be directed at the detection area, and a receiver for reflected coherent light (Columns 5-6; Column 7, Line 55 to Column 8, Line 3) (Figs. 2-8).

With regard to claim 27, Berni discloses that the monitoring apparatus includes video recording apparatus adapted to record a visual record (Figs. 2-4) (Columns 6-10, 13).

With regard to claim 28, Berni discloses the seismic delivery device is adapted to apply the event directly to the sea bottom (Column 20, Line 63 to Column 21, Line 15).

With regard to claim 30, Berni discloses that the monitoring apparatus is adapted to be towed (Column 5, Lines 10-45).

With regard to claim 32, Berni discloses that analyzing includes deriving representations of subsurface layers; and assembling the representatives as a depiction of the geological structure of a region (Column 1).

With regard to claim 34, Berni discloses successively recording light in the form of visible light (Column 5, Line 45 to Column 8, Line 19; Column 9; Columns 13-14).

With regard to claim 35, Berni discloses an apparatus for carrying out seismic exploration comprising: means for generating a seismic event; means for applying the seismic event to a body of water having a sea bottom (Fig. 10) (Column 2; Column 5, Lines 1-10; Column 21, Lines 5-10); detecting apparatus adapted to detect within a detection area of the sea bottom a response to the event including P-waves and S-waves in the sea bottom resulting from the seismic event (Figs. 3-4) (abstract; Column 4, Line 44 to Column 5, Line 45; Columns 8-12; Column 18, Line 50 to Column 19, Line 62); and means for analyzing the detected response (Column 3, Line 45 to Column 5, Line 45; Column 7, Line 16, to Column 21). Berni discloses the detecting apparatus being spaced apart from the sea bottom (Figs. 3-8) (Column 4, Line 44 to Column 6, Line 45). Berni discloses that apparatus wherein: the detecting apparatus includes a monitoring apparatus adapted to monitor successively each of a plurality of non-discrete, overlapping segments defining the detection area to ascertain movements of particles in the detection area over a response period (Column 4, Line 44 to Column 6, Line 45), and a recording apparatus adapted to record a detected response to the seismic event, the response period being a predetermined response period after the seismic event (abstract; Column 2; Column 3, Line 45 to Column 6, Line 45) (Fig. 9). Berni discloses that the monitoring apparatus is moved relative to the sea bottom during the response period (Column 4, Line 44 to Column 6, Line 37; Column 12, Line 37 to Column 16, Line 56).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berni as applied to claims 1-2, 4, 6-13, 16-19, 21-23, 25-28, 30, 32 and 34-35 above, and further in view of Donskoy (6134966).

With regard to claim 14, Berni does not disclose locating the monitoring apparatus from 0.5 to 5 meters above the sea bottom during the response period. Berni gives specifics of the apparatus for use in land surveys, but does not give the specifics of the apparatus for marine surveys. Berni mentions that the apparatus can be used in marine surveys, but does not disclose how it would be positioned. Donskoy teaches a method of monitoring seismic waves directed into the ocean bottom by monitoring the vibration of the seabed with a probe beam (Column 4). Donskoy shows in the drawings that the apparatus is located within 0.5 to 5 m above the seafloor (Figs. 1-6) (Columns 1-4). It would have been obvious to modify Berni to include locating the apparatus near the seabed for marine surveys as taught by Donskoy in order to avoid receive the probe signals without interference from other objects located in the water column.

Claims 15, 20, 29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berni as applied to claims 1-2, 4, 6-13, 16-19, 21-23, 25-28, 30, 32 and 34-35 above.

With regard to claim 15, Berni discloses that using the monitoring apparatus includes using a hydrophone (Column 19, Lines 40-61). Berni discloses that in marine surveys, it is known to record the pressure signal, and this done with a hydrophone.

With regard to claim 20, Berni discloses that using the monitoring apparatus includes monitoring using a plurality of monitoring devices, the monitoring devices being spaced from each other by a distance which is less than the wavelength of the transmitted seismic event (Columns 5-6). Berni does not specifically disclose that the devices are located on cables, but does disclose that moving the devices would be as easy as moving marine seismic cable detectors. It is therefore obvious that the detectors could be located on a cable in order to be able to move them as is done in a marine survey using streamer cables.

With regard to claim 29, Berni discloses that the detecting apparatus includes a hydrophone (Column 19, Lines 40-61). Berni discloses that in marine surveys, it is known to record the pressure signal, and this done with a hydrophone.

With regard to claim 31, Berni discloses that the detecting apparatus includes a plurality of monitoring devices, the monitoring devices being spaced from each other by a distance which is less than the wavelength of the transmitted seismic event (Columns 5-6). Berni does not specifically disclose that the devices are located on cables, but does disclose that moving the devices would be as easy as moving marine seismic

cable detectors. It is therefore obvious that the detectors could be located on a cable in order to be able to move them as is done in a marine survey using streamer cables.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT A. HUGHES whose telephone number is (571)272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Scott A. Hughes/
Examiner, Art Unit 3663